# Implications of Japanese Experience in Fisheries to Asia and the World

**by**

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## Abstract

Fisheries are increasingly important in the world with growing demand for fish in China, Western, African and Asian countries. Many people depend on fisheries and will be benefited from fisheries. Many governments took fisheries promotion policies after the 1970s when the UN 3rd Law of the Sea Conference developed. However, these resulted in over-capitalization, over-fishing, illegal fishing and resource depletion. Together with land-based environmental destruction and anti-whaling movement, capture fisheries situation is not optimistic. Aquaculture have been paid much attention along with poor prospects on capture fisheries. However, aquaculture is not problem free. Most of fisheries problems in the world are repetition of Japanese experience in fisheries now facing a big ban. This paper focuses on lessons learned from Japanese experiences to develop sustainable fisheries in Asia and the world.

Keywords: history of fisheries, Japanese experience in fisheries, sustainable fisheries in Asia

## Introduction

Fisheries drastically expanded in Asia and the Pacific since the 1970s beginning the 200 mile age with the global free trade trend. However, these resulted in over-capitalization, over-fishing and illegal fishing resulting in resources depletion. Together with land-based spawning, nursing and other environmental destruction including water pollution, reclamation and sand extraction, many countries face similar problems which Japan faced years ago and have repeated the same situations as Japan did. Japan experienced a rise and fall of fisheries after the postwar period. She was once regarded as a leading fishing nation in the world and now facing with a crisis of collapse in fisheries. This paper focuses on lessons learned from Japan to develop sustainable fisheries in Asia and the Pacific.

## 1. Fisheries in Asia and the Pacific

The development of the Law of the Sea Conference and the free trade trend since the 1970s provided a big opportunity for many coastal countries in Asia and the Pacific. They strengthen fisheries promotion policies with supports from developed countries as well as newly created related rules and regulations. These policies aim to increase foreign exchange earnings, employment opportunities,

fisher's income, and fisher's living standards. Many governments received fishing fees from foreign fishing in their exclusive economic zone (EEZ) and official development assistance (ODA) and encouraged industrial fisheries and fisheries (and fish processing) joint-ventures with developed countries for technology transfer. Particular interests in Asia have been shrimp culture for foreign exchange earnings while tuna fisheries development in the South Pacific. However, these expansion policies were not well backed up by monitoring, surveillance and control except for tuna fisheries management of the Forum Fisheries Agency in the South Pacific (Moore, 1987). As a result, many conflicts arose between traditional coastal fisheries and newly developed industrial fisheries.

**Shrimp culture:** Shrimp culture in Asia boomed first in Taiwan in the 1970s, followed by the Philippines, Thailand, Indonesia and India in the 1980s, Vietnam and China in the 1990s. Except for China, major species was black tiger shrimp (Penaeus Monodon). However, black tiger shrimp suffered from infectious white spot disease and Taiwan decreased it's production drastically in the 1990s. The same disease has hit the Philippines, Thailand, Indonesia, India and Viet Nam.

On the contrary to high foreign exchange earnings, shrimp culture in Asia has been criticized as:

1) Industrial shrimp culture supported by governments was developed except for a large part of Vietam;
2) Natural environment was destroyed and local residents were suffered from it.
   - Exclusion of residents from traditional working places;
   - Destruction of mangrove areas and resource depletion;
   - More frequency of suffering from flooding and natural hazards;
   - Destruction of self-sufficiency;
   - Water and soil pollution with disease and drug uses; and
   - Abandonment of shrimp ponds every 3-4 years.
3) Dependence of external capital which does not contribute to local society;
4) Irreversibility of converted brackish water shrimp culture pond from rice paddy;
5) Wide existence of carriers of white spot disease and very high mortality over 90%; and.
6) Domestic price hike of shrimps due to their exports.

Many mangrove forests were converted to shrimp ponds in the Philippines, Thailand, Vietnam, Burma, Malaysia, Sri Lanka, Bangladesh, India, Ecuador, Honduras, Columbia and Mexico. From 1980 through 2005, mangrove forests were reduced from 18.8 million hectares to 15.2 million hectares in the world, this is, equivalent to 3.6million hectares. Most of mangrove trees were used for logging for charcoal and others and some of mangrove areas were actually converted to shrimp ponds though it is said as if all lost mangrove areas were converted to shrimp culture ponds (World

Watch Institute, 2007). In Vietnam, large mangrove areas were destroyed by herbicides during the Vietnam War.

Infectious disease problems such as the white spot disease problem have been experienced not only in Taiwan, Philippines, Indonesia, Thailand, India, Vietnam, but also Bangladesh, Ecuador, Honduras, Columbia, and Mexico. In Asia, 150,000 hectares of ponds were abandoned during the 1985-95 period. Some of these ponds are now used by local residents as extensive or semi-intensive poly-culture ponds. In the Philippines, using these ponds they are culturing shrimp with milkfish with water plants such as (rumot and lab lab), tilapia and rabbit fish, and mangrove crab. However, shrimp mortality is more than 90%. Nevertheless their interest in shrimp is very high because the farm price is about US$10.00/kg as compared with about US$2.00/kg for milkfish.

**Fish culture:** Beside shrimp culture, many countries are interested in intensive aquaculture, in particular fish culture. However, intensive aquaculture is not problem free. Mass kill has been reported in Japan (Yellowtail and pearl oyster) and the Philippines (Milkfish). Chile is famous for salmon culture. However, there is no commercial capture coastal fisheries development in 10 provinces famous for salmon culture, and income disparity between rich and poor among fishers has been enlarged. Intensive aquaculture with mono-culture/high density/feeding is also criticized as:

1) It is difficult to culture fish economically without help of externalities;
2) Fish culture requires 7-10 times of edible fish such as sardine and mackerel as feeds, that is, fish culture is a big loss from protein conversion point of view except for herbivore culture;
3) Pollution problems associated with fish culture;
4) Disease/drugs including anti-biotic problems;
5) Intensive fish culture is not sustainable;
6) Intensive fish culture destroys local capture fisheries and does not contribute much to local communities; and
7) Increasing abnormal fingerlings from intensive fish culture.

**Industrial fisheries vs. small-scale coastal fisheries:** Fisheries development plans in many countries aim to increase 1) foreign exchange earnings, 2) employment opportunities, 3) fisher's income and living standard, and 4) fishing community development at the same time. However, meeting these objectives at the same time is very difficult. In many cases, governments tend to take an easy way out and emphasize a capital intensive approach though the role of government is a fair allocation of benefits. As a result, conflicts arise between government supported industrial fisheries and traditional coastal fisheries.

With government supports to industrial fisheries such as subsidies, shrimp and other trawl fisheries as well as purse seine fisheries developed drastically since the 1970s. These mobile gear dominated in Asia and the Pacific ever since. Trawl fisheries in Thailand wiped out fisheries resources in Gulf of Thailand in the 1970s. Shrimp trawls were banned in Indonesia and creeping jurisdictions of shrimp trawls into municipal waters were issued in the Philippines in the 1980s (Lim et al., 1995).

Local governments wish to construct on-shore facilities such as processing plants like PAFCO (Pacific Fishing Company) in Fiji which secures employment among local people, while industries wish to use on-board processing facilities due to economic viabilities (Kronen and Veitayaki, 2005). In Chile, Merluccius productus catch was drastically reduced since 1988 and there was a big conflict between trawl fisheries catching and processing on-board adult Merluccius productus and coastal long-line fisheries which operate in the spawning grounds of the same species .

Tuna fisheries joint-ventures were promoted in Asia and the Pacific in the 1970s and 1980s. However, most of them failed because of hastening of nationalization and distrust in business management (Matsuda, 1992). The Joint-venture is an ideal way to strengthen fishing ventures from both developed and developing countries points of view (Marten et al., 1983) However, it has been very difficult. Solomon Taiyo Ltd., a tuna fisheries joint-venture with on-shore processing plants from 1971-2000, was regarded as a successful fisheries joint -venture which brought wealth and employment opportunities to Solomon Islands. However, it was closed in the mid-2000 after the ethnic disturbances (Barkley, 2007). Though the plant has reopened under local management, the export of tuna has not resumed. Food poisoning by eating spoiled fish became a problem because fish venders collected wasted fish from tuna fishing and sold them in their local market. No one uses ice after harvesting (Chamberlain, 2005). There is no sense of freshness. Fish is fish and there is no difference between old and fresh. Both have the same price. This has been common practices in many islands in the South Pacific.

**International trade vs fisheries problems**

Unlike agricultural commodities, fisheries commodities are regarded as just like other manufacturing commodities such as automobile and television in the WTO framework, though the nature of the commodities are completely different. Thus, most of countries have promoted fisheries trade. As a result, there are many conflicts not only within trading countries but also between fishers and fisheries managers, and between fishers and buyers.

Exporting countries face with income disparity between winners, such as the fishing industries concerned, and looser, such as traditional fishers, in addition to pollution and environmental

destruction such as mangrove destruction. Export prices generally affect domestic prices upward so that local consumers tend to be victimized. Importing countries also face widening a gap between winners such as consumers and exporters of other commodities and looser like fishing communities. The collapse of fishing community means loosing her social functions. Those include food security, environmental security, protection of life and assets of people (rescue and surveillance), marine leisure and education, employment and economic opportunities in rural societies, and cultural heritage. Loss of these functions are resulting in less national security.

IUU (Illegal, Unregistered and Unreported) fishing in tuna fisheries which export their catch has been a big problem among regional tuna fisheries management bodies.
Enforcement capability of the laws and regulations are weak in many countries so that illegal fishing has been common at sea. Dynamite fishing and potassium cyanide fishing destroying coral reefs have been very common, but local administration faces with difficulties in enforcement because they could not provide alternative jobs for those fishers. Political will is expected..

Lobster is a very important export item in Nicaragua. Fishers used to catch lobster at the depth of 30 feet in 1988 but the fishing ground became deeper as resources became scarce and it was at the depth of 120 feet in 1998. As a result, Many local divers suffered from submarine sickness and lost their lives. There are laws but not functioning because governments are favor for fisheries business, not for the residents (Acosta, 2005).

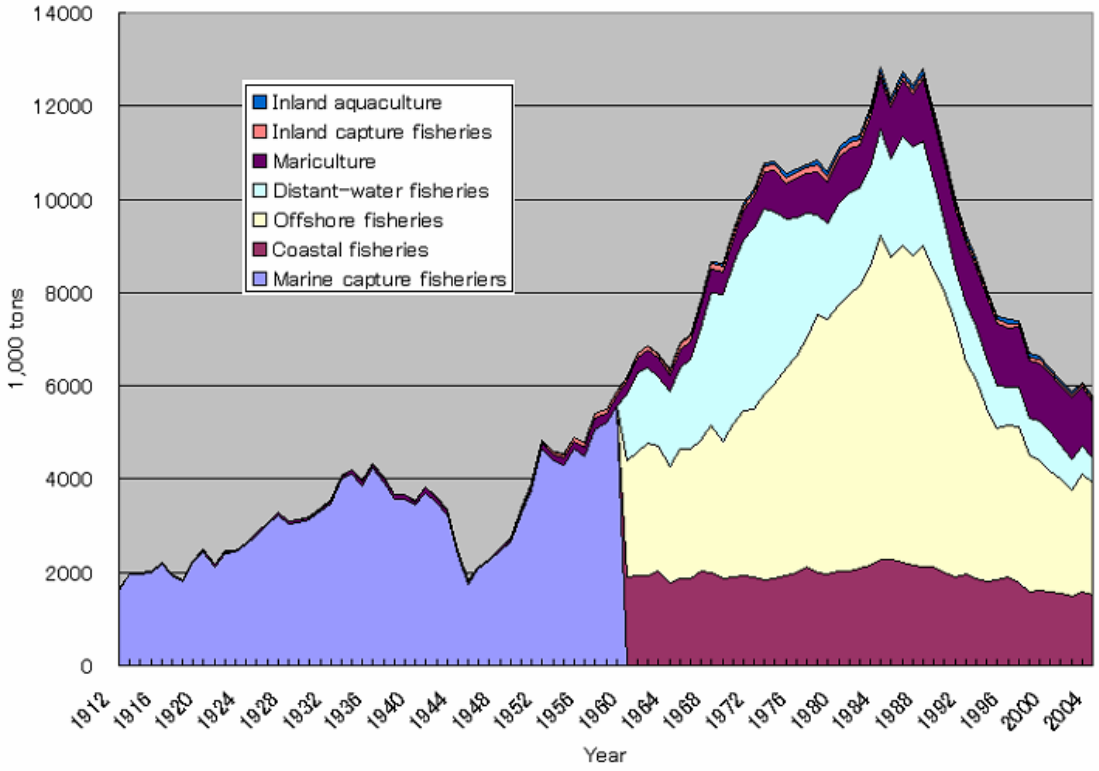
These situations were quite similar to Japan during the 1950s and the 1960s except for access conditions to coastal fisheries. Japan's coastal fisheries are managed by fisheries co-management between government and fishers based on the fishery right and licensing systems, not open access (Lim et al., 1995a). Fishers have regarded the sea as if the sea is ours and excluded sport fishers. As a result, there are big conflicts between commercial and recreational fishers.

**2. Rise and Fall of the Japanese Fisheries**

Fisheries management in Japan started in 701 (Code of Conduct of 701) and it was refined in 1615 (Code of Conduct of 1615) and established customary law of the coastal use in the feudal time. This customary law was integrated into the Meiji Fisheries Law in 1901, and revised into the Fisheries Law of 1949 and the Fisheries Cooperative Association's Law of 1948, both of which are effective at moment. Under the supervision of the Occupation Authority led by General MacArthur, the post-war revision was characterized by securing food security and democratization in fisheries. Fisheries production exceeded that of the pre-war peak by the Japan's independence in 1952.

Fig. 1 shows the rise and fall of Japanese fisheries production. From 1953 to 1973, the fisheries expanded along with the government industrial fisheries expansion policy: From coastal to offshore and from offshore to distant-water fisheries. Oil price was fixed at US$3.00 per barrel and the exchange rate was also fixed at 360 yen per US$. Fishing company employee's salaries were as high as 10 times higher than ordinary salaried men in the late 1950s and early 1960. However, she experienced economic growth with land reclamation and sand extraction resulting in destruction of spawning and nursing grounds, and water pollution against coastal fisheries since the 1950s, dollar devaluation beginning in 1971, GATT Tokyo Round in 1972, oil crises beginning and development of the 3rd Law of the Sea Conference in 1973.

**Fig.1.** Fisheries production in Japan: 1912–2004




Source: Ministry of Agriculture, Forestry and Fisheries, Statsitical Annual Report of Fisheries and Aquaculture Production; Fisheries White Paper 2007.

In Fig. 1, Japanese distant-water catch increased during the 1960s due to an increased Alaskan pollack catch in the North Pacific and offshore catch also increased during the 1970s and the 1980s due to an increased sardine catch in the her offshore waters. However, Japanese fisheries had to accept commercial whaling moratorium in 1982 to avoid general trade conflicts with the United States, the phase-out of the North Pacific fisheries, and corruption of sardine stock in 1988. Due to the economic growth, people's life style has changed and fish imports increased drastically in the

1980s with yen appreciation. Further, corruption of the babble economy and unprecedented depressed economy have continued since 1990. As a result, (1) the fisheries budget decreased from 400 billion yen in 1995 immediately after the ratification of the United Nations' Law of the Sea to 292 billion yen in 2005; (2) production decreased from 12.8 million metric tons in 1984 to 5.8 million metric tons in 2005; (3) fisheries import deceased from 1.95 trillion yen in 1997 to 1.67 trillion yen in 2005; (4) fish self-sufficiency ratio decreased 100% in 1975 to 57% in 2005; and (5) number of commercial fishermen decreased from 1,990,453 in 1952 to 231,000 in 2004.

Current fisheries institutions could not solve the problems in fisheries. Even 1,800 graduates per year from colleges and universities pertaining to fisheries are not interested in helping the situation in fisheries and regard the current fisheries situation as a matter of others, not themselves. Thus, reasons for existence of current fisheries administration, fisheries educational and research institutions and fisheries infrastructure have been diminishing (Matsuda, 2006 and 2007).

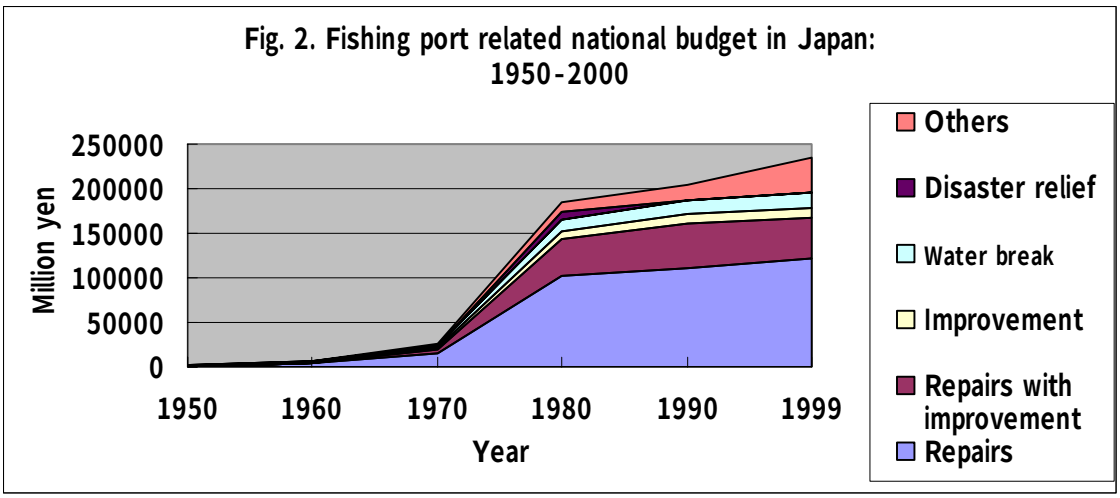
**3. What were wrong in Japan?**

Environment surrounding Japanese distant-water fisheries changed completely from open access to limited access with oil crises and lifting of the fixed exchange rate in the 1970s. Japanese government recognized this and emphasized coastal fisheries development and changed the policy from just capture fisheries to aquaculture and resource management type fisheries with resource enhancement including marine ranching, construction of seaweeds beds, vessel withdrawals, and reduction of fishing efforts to prevent over-fishing.

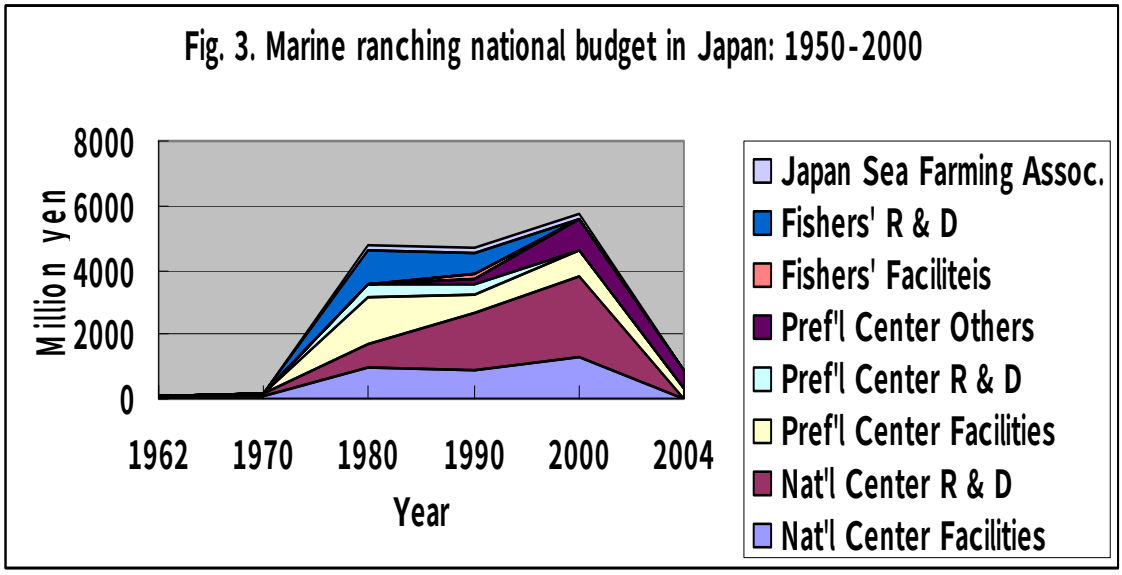
However, government supports are legally backed up, defined each support and implemented rigidly, emphasizing durability, say more than 30 years, as a condition of public work. Thus, fisheries hard infrastructure were strengthened, but necessary soft infrastructure were not well provided. As a result, expected results were not materialized. Fishing Port budgets are said to be one half of Fishery Agency's budget since after the war and unchanged or even more. Fishing port related national budgets are shown in Fig. 2. There was a big transition in the fishery policy in Japan in the 1970s. However, proportions of the public work such as repairs and improvement are not much changed last 50 years. Since 1980, these amounted to 200 billion yen per year. Marine ranching national budgets aiming at resource enhancement are shown in Fig. 3. There was also a big transition in the 1970s just like fishing port budgets. Those were mainly used for facility construction, research and development amounting for about 5 billion yen per year between 1980 and 2000. During these periods, more than 80 species were released.

The result is shown in Table 1. In 1945, the year of Japanese surrender, coastal catch was about 2

million metric tons (Fig.1). All of catch were caught by man power because all vessels with engine




Source: Fisheries Yearbook



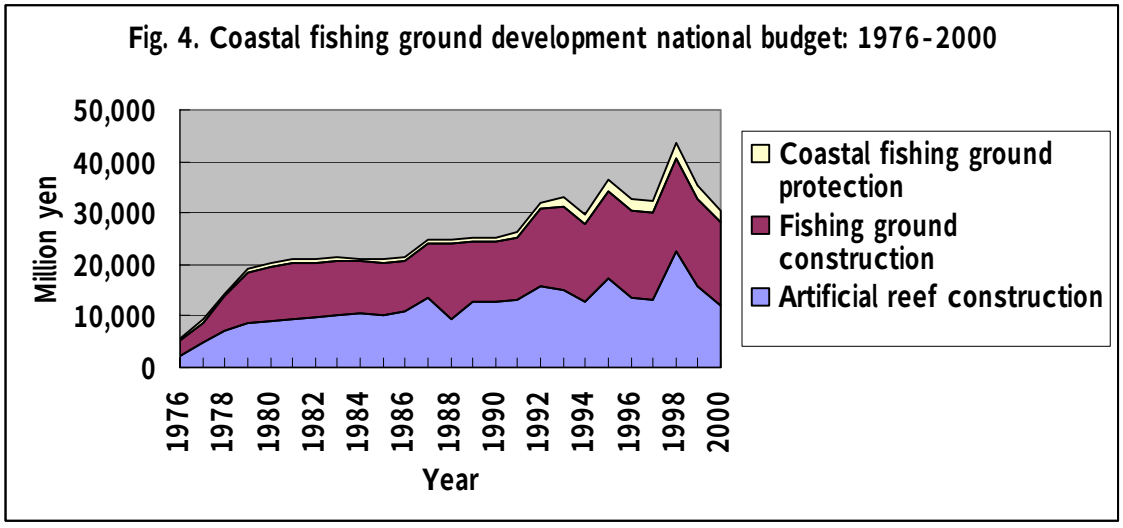

Source: Fishery Agency

were destroyed during WWII. Unlike other species, red sea bream is different from other species because this is also caught by recreational fishers. It is said that the same amount of red sea bream caught by commercial fishers are also caught by recreational fishers. As a result, effects of marine ranching are not clear except for salmon, red sea bream and scallops. Fig. 4 shows the coastal fishing ground development budgets between 1976 and 2000, amounting from 20 billion yen to 40 billion yen per year. This is a national budget which comprises about 50% of total project budgets. Thus, local governments spent the same amount of money to use these national budgets. Major components are artificial reef construction and fishing ground construction. As compared to these

Table 1. Coastal catches of major sea farming species: 1934-2000 (Unit: metric ton)

| Species | 1934 | 1960 | 1970 | 1980 | 1990 | 2000 |
|---|---|---|---|---|---|---|
| Coastal catch | 3,113,000 | 1,893,000 | 1,891,000 | 2,037,000 | 1,992,000 | 1,576,000 |
| Salmon | ? | 34,744 | 45,112 | 99,520 | 172,974 | 179,351 |
| Red sea bream | ? | 21,835 | 18,177 | 15,170 | 13,734 | 15,041 |
| Flounder | ? | 6,211 | 7,210 | 7,113 | 5,517 | 7,572 |
| Kuruma shrimp | ? | 2,986 | 1,263 | 2,307 | 3,157 | 1,447 |
| Blue crab | ? | 4,118 | 997 | 2,807 | 4,105 | 3,131 |
| Abalone | 6,139 | 4,390 | 6,466 | 4,878 | 3,353 | 2,146 |
| Scallop | | 13,870 | 22,152 | 83,134 | 229,667 | 304,286 |
| Sea urchin | ? | 15,871 | 27,177 | 24,158 | 19,398 | 12,455 |

Source: Ministry of Agriculture, Forestry and Fisheries, Statistical Annual Report of Fisheries and Aquaculture Production




Source: Fisheries Yearbook.

big budgets, why Japanese coastal fisheries have been collapsed is a question. This is a problem of centralized approach towards fisheries management which requires a balance of centralized and decentralized approaches according to each local condition. Problems of centralized fisheries management are as follow:

1) **Bureaucracy issue**: Too much tax money is gathered in the central government and government officers tend to feel that we are the government to allocate money and forget that they are servants of people. As a result, they tend to allocate money in easiest ways possible. People against those government approaches have been penalized and/or excluded. Mismanagement and corruptions were the result;

2) **Comparative advantage issue**: With the 6th largest EEZ (447 square kilometers) including one of the three largest fishing grounds in the world, Japan, stretching from North to South for 3,000km, is surrounded by sea .Her coast line extends 35,000km, 85% of earth's circumference, with more than 6,000 fishing villages. Thus, Japan has a comparative advantage in fisheries in which characteristics of the environment are diversity beyond the central government control;
3) **Internal and external faces of fisheries:** Japan has a good design principle of fisheries co-management between government and fishers. However, this principle was handled negatively. This is because Fishery Agency has faced external pressures from other sectors which weaken fisheries viabilities. These include domestic and international ones. Domestic ones are acceptance of reclamation of spawning and nursing grounds, sand excavation, water pollution under the name of national interests. As a result, distrust has prevailed internally and externally. International ones are concessions for export commodities such as automobiles and electrical goods. Acceptances of 1982 UNCLOS and Commercial Whaling Moratorium, phase-out of North Pacific fisheries in 1988, bans of high sea drift net fishery in 1991 and salmon fishery in 1992 and are some of them. In addition, Japan became a largest fish import country in the world under the free trade globalization trend since the 1970s. She imported 1.9 trillion yen at peak in 1997 which is 2nd in Japan and one third of oil imports which are the life line of Japanese economy. Should we be proud of this or see it an abnormal situation?
4) **Too good issue:** Japan's fisheries infrastructure was too good to prevent wasteful use of such opportunities. Construction of fishing port was essential to develop fisheries. However, everything has its optimum size. In Japan, so many fishing ports are not used at moment. Even under such situation, those are not open to recreational fishers. As a result, there are many recreational fishing boats are illegally anchored in rivers and seas. If fisheries cooperative association could include management of recreational fishing boats as an economic and educational activity, both commercial and recreational fishers will benefits. A very small legal revision solves a big problem. There are so many things like this. Marine ranching and coastal fishing ground development can be vitalized by working with many non-governmental organizations (NGOs) and non-profit organizations (NPOs) in this way. The fisheries cooperative system in Japan is a unique co-management system between government and fishers. FCA in Japan has administrative function such as fisheries management of common fishing right areas as well as economic functions. These economic functions are for securing the FCA's administrative function within a respective local condition to maintain and promote healthy local fisheries. Their economic functions include an integrated credit and insurance system to solve fishers' financial problems. With a weak auditing system within FCAs, this was too good to prevent over-debt beyond borrower's repayment capability. As a result, debts within FCAs became huge particularly after the 1980s.

**4. Is there any hope?**

Current wealth of the world is covered up by a babble economy led by credit business, speculators and technocrats. We are just like sitting on a bullet train without brake in this society where so many problems have been addressed and unsolved last half century. Due to imbalances in technical development and scientific base, we must live with uncertainty and nature which are the most reliable assets for human beings. Why don't we take advantage of nature and communities.

No one denies "Ocean age" in the 21st century. However, ocean is not like land. Sophisticated robots and other machines can not function easily because of walls of water, salinity, pressure, biological activities and the like. To take advantage of the sea fully is more difficult for people to reach moon. Thus, it is very expensive to explore the sea. Accordingly, any venture for marine activities requires careful planning, try and error and risk management. Due to the public characteristics of the sea, government supports also essential. In many countries, oceanographic and ocean development studies are supported by military governments such as United States, France, England, Russia and China unlike Japan.

Japan enacted the Basic Law on Marine Affairs in 2007. This is to integrate interests of sixteen Ministers and Agencies pertaining to uses of the sea. The point of success of its implementation depends on how successfully recover and revitalize coastal fisheries all over Japan next ten years so that general citizen feel the sea is close to them and. appreciate fisheries and fishing communities' social functions. If we missed this opportunity, it will be huge burden to the nation as a whole. In the past, people's mind was left from the sea because many good swimming grounds along the coasts were destroyed by reclamation and sand excavation and pupils and students were forced to swim at swimming pool instead for a long time. It has changed their life style. Nevertheless, it is said that there are recreational fishers of 35 million man days a year. Recently, small government budgets have been allocated actually to promote activities contributing to fishing village revitalization. This trend must be strengthened. Japan should take advantage of her strengths and experiences in fisheries, avoiding the continuation of past mismanagement. There are so many ways to improve the situation as described in this paper.

**5. Final remarks**

Most countries in Asia and the Pacific are surrounded by seas and oceans and many people depend on fisheries. One of the characteristics is value addition in fisheries. If people manage fisheries well in responsible manner, the sea brings wealth of oceans. However, if people mismanage fisheries, the sea becomes a place of conflicts. The issue is a matter of political choice between wise use of the sea

and unwise use of the sea. We have leaned both capital and community behaviors. Capital tends to move wherever and whenever gives them better investment opportunities with high risk. Their interest is short-term, not long-term. However, there is no mobility in community. A community must live with the place and nature. Her interest is short/medium/long terms. The role of government is how to integrate pros and cons of these capital and community. Keep this in mind, we must behave better for the future.

**References**

Acosta, M. L., Nicaragua- Legal instruments ineffective, Fish for People, Amsterdam University Press:188-189.

Barkley, K., 2007. Fishing. Western, Japanese and islander perceptions of ecology and modernization in the Pacific, Japan Focus: 1-25.

Lim, C. P., Y. Matsuda, Y. Shigemi, 1995a. Fishery co-management in marine fisheries: The Japanese Experience, Coastal Management 23: 195-221.

Lim, C.P., Y. Matsuda, Y. Shigemi, 1995b. Problems and constraints in Philippines municipal waters: The case of San Muguel Bay, Camarines Sur, Environmental Management 7: 835-852.

Chamberlain, T., Histamine poisoning from poorly handled tuna and other scombroid species, Fish for People, Amsterdam University Press:126.

Kronen, M. and J.Veitayaki, 2005. Local and global scales in Fiji's fishing sector, Fish for People, Amsterdam University Press: 82.

Marten, G., Y. Matsuda, J. Bardach, S. Comitini and S. Hardjolukito, 1983. A goal analysis of alternative tuna fisheries arrangements between Indonesia and Japan, Ocean Management 8:125-150.

Matsuda, Y. Changes in tuna fisheries negotiations between Japan and the Pacific islands Nations, In Resource and Environment in Asia's Marine Sector ed. by J. B. Marsh, Taylor & Francis, New York Inc. 41-57.

_____, 2006. Contributions of responsible fisheries to the UN Millennium Development Goals (MDG) for 2015. Proceedings of the 13th IIFET Conference (IIFET 2006). Portsmouth, July 11-14, 2008 (CD Rom)

_____ 2007. Coastal Governance in Asia and the Pacific, People and the Sea IV: Who Owns the Coast, Proceedings of the Fourth International Conference of Center for Maritime Research (MARE), Amsterdam, 5-7 July 2007 (CD-Rom).

Moore, G., 1987. Enforcement without Force: New Concepts in Compliance Control for Foreign Fishing Operations, Essays in Memory of Jean Carroz: The Law of the Sea, FAO:159-169.

World Watch Institute, 2007. Coastal Areas Endangered by Destruction of Mangrove, Vital Signs 2006-07:128-131 (Translated in Japanese)